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09/755,859	01/05/2001	Victor Il'ich Kopp	1014-7	3690

7590

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EXAMINER

LANDAU, MATTHEW C

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 07/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/755,859

Applicant(s)

KOPP ET AL.

Examiner

Matthew Landau

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 4-8, 10-14 and 17-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 9, 15 and 16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 15 April 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- |                                                                                              |                                                                             |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Drawings***

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on April 15, 2003 have been accepted. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

### ***Specification***

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The specification does not provide sufficient antecedent basis for “periodic refractive index modulation” and “predefined amplitude”.

### ***Claim Objections***

3. Claim objected to because of the following informalities:

In regards to claims 1 and 15, it is unclear what is meant by the limitation “laser emission of a predetermined area”. Is applicant referring to the cross sectional area of the output beam? Further regarding claim 15, the limitation in paragraph b “such that such that said structure” is objected to. It is suggested Applicant remove the duplicate phrase.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1 and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1 and 15 contain the newly added limitations said periodic structure having a periodic refractive index modulation, between said top and said bottom surfaces, of a predefined amplitude..." and "wherein said predefined amplitude is selected such that..." are not described in the specification. The specification makes no mention of the amplitude of the periodic refractive index modulation, therefore the ordinary artisan would not be able to determine if the inventors had possession of the claimed invention at the time the application was filed.

6. Claims 1 and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The limitation "said

Art Unit: 2815

periodic structure having a periodic refractive index modulation, between said top and said bottom surfaces, of a predefined amplitude such that said structure produces a photonic mode having a lasing threshold and being of a predetermined frequency, and a plurality of additional photonic modes of different frequencies, wherein said predefined amplitude is selected such that said predetermined frequency is greater than a value determined by a following expression:  $F_L + c/2TN$ , wherein  $F_L$  is a frequency of a nearest lower frequency photonic mode of said plural additional photonic modes” is not enabled by the specification. The ordinary artisan would not be able to determine how to make a periodic structure with a “periodic refractive index modulation”, having a specific amplitude that meets this limitation. The specification does not provide any details or examples of structures that have the required amplitude, nor does it provide any guidance for determining this amplitude. In addition, the specification does not disclose how the “frequency of a nearest lower frequency photonic mode” is determined, or what structural features this value depends upon.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1 and 15 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regards to claims 1 and 15, the limitation “periodic refractive index modulation” renders the claims indefinite. It is unclear what is meant by this limitation. Does applicant intend to claim the refractive index is changed during operation of the laser, or does this

Art Unit: 2815

limitation simply mean that the refractive index varies periodically throughout the thickness of the device? It is also unclear how a modulation can have an amplitude. It cannot be determined what is meant by a modulation amplitude, since no examples of this value are provided in the specification and the ordinary artisan would not be familiar with this terminology. It is also unclear how the equation (specifically the term  $F_L$ ) structurally defines the claimed laser apparatus, since no examples of specific structures (including values for each of the terms in the equation) are provided in the specification. Furthermore, it is also unclear what is meant by “a nearest lower frequency photonic mode”. Nearest to what?

### ***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1-3, 9, 15, and 16 rejected under 35 U.S.C. 102(e) as being anticipated by Kopp et al. (US Pat. 6,404,789, hereinafter Kopp).

In regards to claim 1, as best the examiner can ascertain the claimed invention, Figures 1A and 2A of Kopp discloses a laser apparatus for producing single mode large-area coherent lasing, comprising: a periodic structure 10 of a thickness T and having an average refractive index N, having a top surface and a bottom surface, said periodic structure having periodic

Art Unit: 2815

refractive index modulation, between said top surface and said bottom surface, of a predefined amplitude such that said structure produces a photonic mode having a lasing threshold and being of a predetermined frequency, and a plurality of additional photonic modes of different frequencies; a light-emitting medium 12 disposed within said periodic structure, said light emitting medium being configured to emit electromagnetic radiation at said predetermined frequency; and variable excitation means 22, connected to said periodic structure 10, for exciting said light emitting medium to produce optical gain of a predetermined gain magnitude in said periodic structure, said predetermined gain magnitude being sufficient to meet said lasing threshold, such that laser emission of a predetermined area occurs at said predetermined frequency in direction perpendicular to at least one of said top and said bottom surfaces. As best the examiner can ascertain, the limitations “wherein said predefined amplitude is selected such that said predetermined frequency is greater than a value determined by a following expression:  $F_L + c/2TN$ ” and “wherein said predetermined area remains coherent...” are merely recitations of intended use that does not structurally distinguish the claimed invention over the prior art.

In regards to claim 2, Figure 2A of Kopp discloses the photonic mode is a defect mode.

In regards to claim 3, Kopp discloses the periodic structure comprises a plurality of dielectric material layers (12 and 14) of two differing dielectric constants (column 5 lines 15-25).

In regards to claim 9, Figure 1A of Kopp discloses said light emitting medium is composed of a material adapted to produce optical gain inside said periodic structure upon application of a charge current thereto, and wherein said variable excitation means comprises: a plurality of electrodes (18 and 20) connected to said periodic structure 10; and a tunable electrical power source 22, connected to said plurality of electrodes (18 and 20) for providing

Art Unit: 2815

said charge current to the periodic structure 10 to produce optical gain inside said periodic structure (column 5, lines 15-25).

### ***Allowable Subject Matter***

11. Claims 15 and 16 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not disclose or suggest, either singularly or in combination, a method including at least the steps of “wherein said predetermined area remains coherent during the single mode lasing when predetermined gain magnitude is selectively increased above said lasing threshold”.

### ***Response to Arguments***

12. Applicant's arguments filed April 15, 2003 have been fully considered but they are not persuasive.

In response to Applicant's arguments regarding claim 1 that Kopp does not teach a configuration that ensures “the laser beam maintains its coherency during single mode lasing even if the gain magnitude significantly exceeds the lasing threshold”, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.



In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). As best the examiner can ascertain, the structure of Kopp is capable of performing the intended use recitation.

### ***Conclusion***

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (703) 305-4396.

Art Unit: 2815

The examiner can normally be reached from 8:00 AM-4: 30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Matthew C. Landau

Examiner

June 27, 2003



**EDDIE LEE  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800**